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A Note From The Editor

In reestablishing the TRANSACTIONS of The New York Academy of Sciences as Series II in 1938, after an ad interim *period of 41 years, the Council was guided primarily by requests from the membership. The purpose of the new issue was "... to cover the proceedings of the stated meetings; various matters of general interest to the members of the Academy; and, especially, to give an opportunity to scientists presenting papers in the Sectional Meetings to publish abstracts of them at the earliest possible date." (From page 1, Volume 1 of the new Series published in November, 1938).*

During the ten years that have elapsed since that time, this Series has progressively expanded in both scope and distribution. It has not only kept pace with the general development of the Academy, but despite increasing production costs, the coverage of scientific papers contained in the TRANSACTIONS has been improved to the point where, instead of merely printing short abstracts, the papers presented at the various Sectional Meetings are, if possible, published in full.

Volume 9 of TRANSACTIONS consisted of 342 pages. With Volume 10, the format has been changed, so that now each page contains about 30 per cent more text matter than was previously possible. In spite of this fact, the pagination of the present volume will probably run close to 300. Hitherto, the illustrations have been limited to line cuts to avoid excessive costs; but since the reports on teropterin presented at the Biology Symposium in December were exceedingly important, it was decided to issue a Special January Number having a color plate and halftones, as well as a cover. The response to this experiment has been more than gratifying.

The Editors are always on the lookout for possible additional service to the membership and have endeavored to follow the Council's instructions to include "various matters of general interest to the members of the the Academy." So far, this has consisted of records of conferences, prize announcements, summaries of the Annual Meetings, and lists of new members. It often happens that, once a member has been elected, there is little opportunity for him to become generally known to the Academy members unless he takes active part in a conference or serves in some other official capacity. However, his activities outside the Academy may be of regional, national and even international importance, and his fellow-members, naturally, would be interested in learning about them.

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For instance, an item in the New York Herald Tribune *(dated February 11) caught the Editorial attention. Lord Inverchapel, the British Ambassador to this country, recently awarded decorations and medals to certain American citizens who contributed to the Allied war effort in various fields of scientific research and development. The list of recipients of the King's Medal included the names of two of the Academy's Councilors, Doctor Hans T. Clarke and Doctor Caryl P. Haskins, among others of the country's leading scientists.*

This is news of interest to the Academy members, and such items could readily be brought to their attention in the TRANSACTIONS. News of appointments, honors, awards, publication of unusually significant papers, current or projected expeditions can easily be distinguished as desirable foci of such a policy, and the Editors would be glad to print such items; but the Editorial Office cannot properly cover such information without assistance and, in this connection, individual members of the Academy may be of invaluable service to the membership at large by helping us in collecting material of this kind.

It is hoped that there will be an enthusiastic response to this request. The Editors, of course, reserve the right to select such items as would be suitable, so far as space will permit. Clippings and other information should show the name and date of the source publication, if any. Address all correspondence to the Editor of the TRANSACTIONS. The deadline for news contributions to each number would be the tenth day of the month during which the issue goes to press.

The success of this project depends on the cooperation of our fellow members.

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SECTION OF BIOLOGY*

CHANGES ACCOMPANYING INDUCED RESISTANCE OF STAPHYLOCOCCI TO PENICILLIN

By W. DEXTER BELLAMY†

The phenomenal success of penicillin therapy in many infections has stimulated great interest in its mode of action, from both a theoretical and practical point of view. The great amount of time, energy, and money spent on the study of the mechanism of penicillin action indicates the general agreement that more intelligent penicillin therapy, as well as a more logical approach to the synthesis of penicillin-like compounds, could result from a more complete knowledge of the mode of action.

A study of the mode of action of antibiotics can be approached from what may be called three levels of structural complexity. The highest of these is a study of the effect of the antibiotic on the living organisms and their response to it. The simplest of these is a study of the functional groups involved, the relative positions of these groups, and other problems of a molecular order. The level of intermediate complexity is the study of the individual enzymes and coenzymes involved in the action of antibiotics. The matter of determining which of the many hundreds of enzyme-catalyzed reactions are involved has no ready solution. The studies of the effect of penicillin on isolated enzyme systems have been unsatisfactory. Concentrations of penicillin thousands of times the bacteriostatic level have been found inactive when tried in this manner. The whole problem of mode of action in the case of penicillin is further complicated by the fact that it is effective only against young growing cells. A possible approach to this problem is a comparison of the properties of penicillin-sensitive and penicillin-resistant variants of the same organism. The changes caused by growth in the presence of penicillin could indicate the site or sites of action of the antibiotic.

This paper will present some preliminary results obtained by a study of penicillin-resistant variants of *Staphylococcus aureus.*

Cavallito *et al.*[1-3] showed that a variety of antibacterial substances could be classified on the basis of their behavior toward thiols. Some react rapidly with a large variety of -SH compounds, others react rapidly only with cysteine or related β-amino alkane thiols, while still others display reactions intermediate between these two extremes. Klimek *et al.*[4] found that a correlation exists between induced resistance and reactivity toward thiols.

Compounds such as penicillin, streptomycin, and the active principle of *Asarum canadense* are examples of compounds which react rapidly only with cysteine and β-amino alkane thiols. *Staphylococcus aureus* can develop marked resistance against these compounds. The resistance to penicillin was increased 60,000 times in sixty serial transfers. The resistance to streptomycin and to the active principle of *Asarum canadense* increased even more rapidly.

Very little resistance could be built up to allyl-2-propene-1-thiol sulfinate, the active principle of *Allium sativum,* or to the active principle of *Arctium minus*—two compounds which are able to react with a wide variety of thiol compounds.

Intermediate resistance was developed

* The Section of Geology and Mineralogy held a meeting on February 2, 1948, at which Mr. Glen F. Brown, Department of Geology, Northwestern University, Evanstown, Illinois, presented a paper entitled, *The Geology of Ground Water in the Nejd, Saudi Arabia,* illustrated by lantern slides. An abstract of this will be published in a later number of TRANSACTIONS.

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to pyocyanine and gliotoxin—compounds which are intermediate in their reactivity toward thiols. Aspergillic acid appears to lack the power to stimulate resistance development by *S. aureus*. This antibiotic also failed to react with any of the thiol compounds tested.

Both Klimek *et al.*[4] and Abraham *et al.*[5] reported that penicillin-resistant staphylococci grew more slowly than did the parent strain. Highly resistant variants were observed to grow almost exclusively at the surface of broth cultures. It was this observation which led us to suggest the loss of anaerobiosis as a possible cause for slower growth of the penicillin-resistant variant. A corollary of this theory would suggest that organisms that cannot grow aerobically would develop little resistance to penicillin.

Experiments were performed to test the above theory, using a penicillin-sensitive *S. aureus* and a penicillin-resistant variant of this culture obtained by serial transfer in increasing concentrations of penicillin. Aerobically, the resistant variant grew about one-half as fast and, at 50 hours, reached about eight-tenths the final turbidity of the sensitive parent culture. Anaerobically, the penicillin-resistant variant did not grow at an appreciable rate.[6]

The attempts to induce penicillin resistance in three organisms that are not able to grow by aerobic processes alone were unsuccessful. The resistance of *Streptococcus faecalis* increased 11 times in 47 transfers, that of *Streptococcus mastitidis* 6 times in 20 transfers and that of *Clostridium welchii*, 10 times in 25 transfers. The evidence strongly suggests that penicillin interferes with one or more essential components in the anaerobic energy mechanism of susceptible organisms.

Staphylococci are frequently characterized by their ability to produce acid from certain carbohydrates, to grow in the presence of 6.5 per cent sodium chloride, and to reduce nitrates. The increase in resistance was found to be accompanied by a progressive loss of these physiological functions until only the production of acid from glucose remained.[7]

Nicotinic acid or nicotinamide and thiamine are the only growth factors normally required for the growth of *S. aureus*. A penicillin-resistant variant was found to require thiamine for growth but not nicotinic acid. Further experiments indicated that this resistant variant synthesized nicotinamide during growth. The amount of nicotinamide synthesized was equal to that produced by *Escherichia coli* and *Bacillus subtilis*, two organisms known to synthesize nicotinamide.

Many strains of *S. aureus* produce penicillinase, a penicillin-destroying enzyme, but *S. aureus* 209 P does not. Several authors[8, 9] have reported that the penicillinase produced by staphylococci was intracellular and was not obtained cell-free. All attempts to demonstrate an active penicillinase in cells of intermediate resistance were unsuccessful. It was found, however, that when the resistance reached approximately 60,000 times the original, a penicillinase was produced. This penicillinase was found to be extracellular and was produced only in the presence of penicillin.

The morphological changes accompanying induced resistance to penicillin have been studied rather extensively. Since Gardener[10] observed that exposure to penicillin was accompanied by swelling of the bacterial cells, many authors have confirmed and extended his observations. Klimek *et al.*[4] have shown that recently derived resistant variants of *S. aureus* 209 P are larger than the parent culture and are gram-positive. When the resistance became equal to 12,500 times the original, however, the cells were found to be smaller gram-negative pleomorphic cocci and bacilli. Reversal to the original gram-positive character was obtained by transferring to a penicillin-free medium. It was later found that 24 serial transfers at a penicillin concentration greater than 1 mg. per ml. produced a variant that re-

tained its gram-negative character as well as its resistance to penicillin. Fifty-four transfers in broth without penicillin have failed to reverse the gram stain or decrease the penicillin resistance.

Growth in a deficient medium consisting of 0.05 per cent yeast extract, 0.5 per cent glucose, 0.5 per cent K_2HPO_4, 1 mg. per cent thiamine, and 1 mg. per cent nicotinic acid will cause a reversion to the original gram-positive cocci as well as a loss of most of the penicillin resistance.

Gale and associates at Cambridge[11-13] have been carrying out an extensive study of amino acid metabolism of bacteria using the specific amino acid decarboxylases for assays. They have found that the gram-positive bacteria have the ability to concentrate free amino acids within their internal environment until the internal concentration is several times that of the external medium. Certain amino acids such as lysine cross the cell membrane by simple diffusion. Others, including glutamic acid and histidine, can enter the cells only if a source of energy such as glucose is also present. Some surface active agents (tyrocidin, cetyl trimethyl ammonium bromide, and aerosol o. t.) release the internal free amino acids. This was interpreted to be due to rupture of the semi-permeable cell membrane. Electron micrographs of tyrocidin-treated cells showed cell wall damage. Penicillin was found to have no effect on the internal free amino acid content of resting cells.

It was found, however,[14] that penicillin prevents the assimilation of glutamic acid by growing cells of *Staphylococcus aureus*. This loss of ability to assimilate glutamic acid precedes the cessation of respiration and the ability to ferment and oxidize glucose. It appears to be simultaneous with the loss of viability.

Using variants of differing penicillin resistance, it was found that there is no relation between the concentration of free glutamic acid within the cell and its sensitivity to penicillin.[15] The external concentration of glutamic acid necessary to produce a 50 per cent saturation of the internal environment, however, increases as the penicillin resistance increases up to a penicillin resistance of 2,000 units per ml. The highly resistant organism developed by Klimek, as well as one developed by Gale and Rodwell,[16] were found to be unable to concentrate free amino acids within the cell. These highly resistant organisms could synthesize all the amino acids necessary for growth from ammonium sulfate as well as the necessary nicotinamide.

The changes listed above indicate that the organism has been forced to undergo fundamental changes in its metabolic mechanism in order to survive and grow in the presence of penicillin. Further study could indicate which of the many changes are the primary sites of penicillin action and which are secondary. These studies could also indicate means of preventing development of resistance to penicillin.

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SECTION OF PSYCHOLOGY

METHODS OF CONTROLLING PSYCHOLOGICAL FRAUDS

By DAEL WOLFLE*

Since the American Psychological Association keeps me too busy dealing with psychologists to allow much time for cultivating the acquaintance of our fraudulent fringes, I am not personally acquainted with very many psychological quacks. I shall not, therefore, attempt to regale the reader with a lot of case histories of the deeds and misdeeds of the quack psychologists. Lee Steiner's book, *Where Do People Take Their Troubles,*[8] has recently done that job excellently and I am sure everyone is familiar with the fraudulent practices by which untrained and frequently unethical persons who call themselves psychologists gain a living without regard for the welfare of the gullible clients who come to them seeking help.

Though, as I said, I am not personally acquainted with many of these fraudulent characters, the APA office is very frequently at work on one or another phase of the problem of attempting to curtail their activities. It is this problem which I propose to discuss here: How can we protect the public against the psychological frauds?

No one knows how many people there are in this country who earn their living by advising clients on their personal and emotional problems. No one knows the total number, but unquestionably most of them are untrained, incompetent, or outright quacks. A recent article in the magazine *This Week*[4] estimated the number of quacks as over 25,000. In contrast, there are probably not more than 3,500 qualified psychological, psychiatric, and vocational counselors in the country. The quacks, therefore, outnumber the legitimate counselors by at least six to one.

While for the United States, as a whole, I can only estimate, for several cities there have been exact surveys of the people who offer their services as psychological consultants. In the April issue of the *American Psychologist,* we expect to publish brief summaries of two of these studies which were made in Cincinnati and Los Angeles, and I am taking advantage here of an editor's advance knowledge of what will appear in his journal by drawing upon these still unpublished manuscripts.

Edward Shoben[7] found that, in Los Angeles, less than ten per cent of those who listed themselves as clinical psychologists had adequate training by present standards. Only a fifth of those surveyed belonged to the American Psychological Association and only a sixth had an M.A. or Ph.D. in psychology. A review of the 40 persons upon whom he secured most data (out of the 88 individuals who listed themselves as clinical psychologists in the classified telephone directory) shows an interesting variety of occupational backgrounds. Eight had been public school teachers and six college teachers, not all of whom, by the way, had taught psychology. Four were previously social workers and two each had been personnel interviewers, vocational counselors, ministers, and engineers. Two were psychologists, one from a court and one from a hospital. One each had been an artist, a farmer, a speech rehabilitation officer, an osteopath, a bank teller, a lawyer, a musician, an auditor, and a plumber. One had had no previous experience and five refused to give their former occupations.

Seventeen of the 40 had Ph.D. degrees, but only 6 were in psychology. Ten more had graduated from college and the other 13 had no legitimate college degrees, unless we accept those they received from the

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College of Universal Truth and similar institutions.

Thirty-five of the self-styled clinical psychologists did not give Dr. Shoben any information about themselves. What their backgrounds were like we can only guess, but the 53 from whom he did secure some information contained several whom one would never recommend as consultants on personal emotional problems. There is, for example, a firm of three consultants whose director is an artist. One of his partners was a plumber for 15 years. The other partner was an industrial engineer without a college degree; in 1945 he became interested in hypnosis, read the literature on the topic, and set himself up as a specialist in hypnotic treatment. Now the artist, the plumber, and the practical engineer have joined forces and are offering their services as counselors and psychotherapists.

I have said that only a fifth of the group upon which Shoben secured reasonably adequate information were members of the American Psychological Association. It is, of course, perfectly possible for a qualified counselor to remain outside the APA, and, unfortunately, it is sometimes possible for an incompetent one to become an APA member. But APA membership is one indication of competence; at the very least, it means that the person has had one year of graduate work plus one year of satisfactory experience in psychology. In the absence of any form of certification or licensing in most states, APA membership provides an imperfect but usable criterion of professional acceptability. Its usefulness is increased by the fact that we know that the APA includes some 90 per cent of the people in the United States who are eligible for membership.

Using APA membership, previous occupation, and education as criteria, I would summarize Shoben's Los Angeles findings by saying that at least three-fourths of the group he surveyed are, at best, inadequately trained, or at the worst outright quacks.

In Boston, Lowell Trowbridge[9] interviewed 70 vocational counselors. Only one had a doctor's degree in psychology. Several had masters' degrees, but most of them were in fields other than psychology. Only 5 of the 70 were APA members.

In Cincinnati, Henry David[2] studied the individuals and organizations listed as psychologists in the classified telephone directory. Of six psychologists listed, two were APA members. One of the other four was listed in another section of the directory as a Registered Masseur.

I do not know of any detailed study of the city of New York, but estimates are easy to secure. The classified telephone directory lists 73 individuals and 37 organizations under the heading "Psychologists." Only a third of these individuals were found to be members of the APA. Some of the organizations were perfectly acceptable; many were not. Incidentally, the best ratio was in Brooklyn, where 6 out of 13 psychologists were members of the APA. In the other boroughs the APA members were greatly outnumbered by the non-members.

If we include related classifications, such as "Vocational Guidance," the total number of persons listed in the directory is 111 and the total number of organizations 123. One-fourth of the individuals are members of the APA. Some of the organizations include APA members on their staffs, but as far as I can tell the great majority do not.

I am concerned over this situation because the average citizen has a right to receive competent help in solving his emotional and personal problems just as he has a right to receive competent help in solving his medical and legal problems, but does not have the means of distinguishing the competent from the incompetent, the ethical from the unethical counselor or psychologist.

Frequently, Mr. John Q. Citizen does not know what ails him. He knows that

he is in trouble, and that is sometimes about all he knows of his difficulty. Medicine is better established and better advertised than psychology, yet half the people who go to a physician have "functional" rather than organic ailments responsible for their complaints. As one specific example, 48 per cent of patients who consult doctors for gastrointestinal ailments have nothing organically wrong with their gastrointestinal systems. If the ordinary person does not know what kind of medical attention he needs, how can we expect him to know what kind of psychological service he requires?

Lester Guest[3] has recently conducted a study of the public's knowledge of psychologists. He found a vague but moderately satisfactory level of knowledge of what a psychologist does. Sixty-two per cent of the public have a favorable attitude toward psychologists, and less than one per cent consider a psychologist a suitable person to visit to get one's mind read. But 26 per cent believe that psychologists *can* read minds if they want to; and 40 per cent do not know any reason for ever seeing a psychologist. If the average citizen *does* want to find a psychologist, Guest's data show that he is most likely to ask a doctor to recommend one and next most likely to use the telephone directory as a source of information. Sixty per cent believe that a psychologist must be licensed in order to practise and only 18 per cent know that this is not the case.

I have been quoting statistics to prove that the average citizen has little knowledge upon which he can base an intelligent choice of a psychologist to counsel him on his personal problems. The statistics all point to this conclusion, though, in a sense, they are unnecessary. Every clinician and counselor knows that he frequently has calls from people who are utterly confused over what ails them and what kind of service they need. Many of these people take their troubles to quacks and charlatans.

The public needs protection against these quacks. It needs this protection for three reasons. First, because the money spent on quacks is wasted money. The quack's charges are not determined by his competence, but by what he can collect. Shoben found that, in Los Angeles, fees ranged from $3 to $25 an hour with a median of $10 an hour. If we accept the estimate of 25,000 quacks in the country, assume that they charge the median fee found by Shoben, and assume that they work a standard five-day week and see six patients a day, we arrive at a total annual take of $375 million. This is about 10 per cent of the annual cost of medical care in the United States.[5] It is more than three times the sum that was spent in this country, in 1947, for basic research in all of the sciences. Furthermore, my estimate of $375 million for psychological quacks may be conservative. In the article in *This Week,* the annual cost is estimated at over one billion dollars.

Second, protection is needed to allow the troubled citizen to secure legitimate and competent help in solving his problems. As long as he cannot distinguish the quack from the honest counselor, he has a fair chance of failing to secure the help he needs. This means that, in the extreme case, protection is needed against the danger of outright harm to the troubled person. In many cases his visit to a quack may be harmless, may be nothing more than wasted time and money. But in some cases, his failure to secure competent help means that a minor difficulty grows more serious, a condition that could be remedied is allowed to progress until it is beyond help. The quack's counsel thus may be positively dangerous or harmful.

The public, then, needs protection against wasted money. It needs an opportunity to secure legitimate assistance. It needs protection against the danger of outright harm. These are the reasons for considering how we can drive the quacks out of business.

It is sometimes said that the reason for

concern over the quacks in any field is to protect the legitimate persons in that field. This is a useful purpose, but in the field of psychology it is now an unimportant one. Trained psychological consultants have more work than they can handle. If they should have too few clients to consider themselves successful, there are so many other psychological opportunities to turn to that no competent psychologist need be out of work. The only reason worth considering for attempting to protect society against the quack is the welfare of society itself.

There are two groups from whom protection is necessary. They should be distinguished from each other since the appropriate methods of protection differ for the two groups. One includes the well-meaning but inadequately equipped person. The second, usually called frauds or quacks, includes those who are neither honest and well-meaning nor, usually, adequately trained. The occasional person with appropriate academic training and experience who uses those assets unethically belongs to the second group. Actually, of course, the two shade into each other. Adequacy of training is not an all-or-none affair; there are degrees of adequacy and competence. Neither is ethical behavior an all-or-none question; it too shades gradually from the very good to the very bad. For purposes of discussing methods of control and protection, however, it is convenient to separate the persons from whom protection is needed into these two groups.

Protection against the honest but inadequately trained practitioner is almost entirely a problem for the professional associations to solve. The APA, by its membership requirements, the requirements of its Divisions, by its standards and the code of professional ethics which it will some day adopt, and the state psychological associations by similar methods, will be able gradually to eliminate the sincere but marginally trained psychologist. The licensing and certification laws which we shall consider later will also help to remove this kind of psychologist from the scene.

There are four things that we can do to protect society against the psychological racketeer. I shall name them, and the rest of the paper will be spent in their discussion.

(1) We can provide education concerning the problem and can attempt to educate the public to choose its psychological consultants with discrimination.

(2) We can make good services more generally available, so that the public will not have to go to the quack.

(3) We can establish standards of competence that will serve as a guide to psychologists themselves and to members of other professional groups who sometimes refer patients to a psychological consultant. These standards of competence will also be useful to the patient himself in knowing which consultants can be expected to render competent service.

(4) Finally, we can use legal means for prosecuting the quack and attempting to drive him out of the field.

The problem of popular education is one to work on continuously. Lee Steiner's book which I have already mentioned and the reviews and radio programs which it prompted were excellent educational measures, but a great many people never heard of them. Last fall, the Sunday supplement *This Week* published the previously mentioned article[4] describing the extent to which psychological quacks were preying upon the public. Unfortunately, this article overlooked the psychologists and made the statement that the country's 4,500 psychiatrists constituted the public's only protection against the psychological quack. Nevertheless, the article did inform many people of the activities of these quacks.

A more positive kind of popular education is found in a pamphlet written by

Harold Seashore for the YMCA, entitled *All Of Us Have Troubles.*[6] It provides the reader with criteria for distinguishing the quack from the reliable consultant and tells him what to do when he finds himself in emotional difficulties on which he feels the need of help. There should be many more efforts along the lines of Seashore's pamphlet.

Our strongest allies in a campaign of public education are the newspaper and the popular magazine. Last May, one of the Chicago newspapers printed a daily series of articles recounting visits by a reporter to some of the quacks operating in that vicinity. A similar series of articles exposing so-called psychological consultants in Detroit was featured by one of the Detroit papers last September. Here in New York, the newspaper PM is featuring an excellent series of articles written by Albert Deutsch. During the past year, several national magazines have published articles that have served as part of a good educational program. Some have exposed quacks. Some have been warnings that the buyer must beware in buying psychological counsel. Others have consisted of descriptions of the activities of good counseling agencies. All, in one way or another, have helped provide public education on the availability of good and the dangers of bad counseling. Nevertheless, the articles, so far, are only a beginning. As long as the quack psychologist is able to flourish, it will be necessary to continue to provide public information about his activities.

The members of the APA, particularly the college professors, could make an important contribution to public education by spending a little lecture time in describing the community's psychological resources and in giving the name and type of service each agency is equipped to render. Information on how to distinguish a reputable psychologist from a charlatan could profitably be included. Harold Seashore's booklet[6] will provide ideas for such a lecture. Lecture time spent in this fashion would present information to all the class members, and through them to a larger circle of relatives and friends.

The second part of the solution to the quack problem lies in making competent counseling service more generally available. In many parts of the country, such services simply cannot be had. The 1946 *Directory of Psychiatric Clinics* published by the National Committee for Mental Hygiene lists a total of 920 clinics, exclusive of Veterans Administration centers. Of these, 78 are in New York City and 296 are in the State of New York. This is a high percentage for one state. Community clinics exist in only a small number of our cities. School psychologists are unknown in most of the country's schools.

One reason for the scarcity of clinical and counseling facilities is lack of public understanding of their importance. Another is lack of trained personnel. The American Psychological Association has about 5,000 members. Of these 5,000, approximately 1,200 are actively engaged in clinical and counseling work either independently or as part of an organization. The American Psychiatric Association has 4,000 members, of whom 1,100 will see private patients. The National Vocational Guidance Association lists 4,100 members; I have not been able to determine what percentage accepts private clients. Let us assume it is about the same as for the two other associations. If we add together all the psychiatrists, psychologists, and vocational counselors in these three associations, the total is less than 14,000. If we remove from this total the overlapping membership and those who are employed in teaching, research, or administration, or who are in agencies where their services are limited to a specific group, such as the Veterans Administration, a state hospital, or a particular school, the remainder is only about 3,500. Those counselors are available to serve a population of 140 mil-

lion; that means one counselor to every 40,000 people in the country.

Strenuous efforts are being made to increase the number of psychological and psychiatric counselors available. The Veterans Administration now employs 800 psychiatrists and 300 psychologists. They estimate their real needs, at the moment, as about twice that figure. By 1960, they expect to need 3,400 psychiatrists and 1,500 psychologists. As a start toward meeting these needs, the Veterans Administration now has in training about 400 prospective psychiatrists and about 500 prospective psychologists whose expenses the VA is paying. These students will help relieve the national shortage, but most of them will accept employment with the VA itself and will therefore not be available for general practice.

The United States Public Health Service is beginning to develop the program authorized by the Mental Health Act passed by the 79th Congress. That act authorizes the Public Health Service to provide funds to aid states in the development of their own mental health programs. It also provides money for scholarships to students in training for work in psychology, psychiatry, psychiatric nursing, and psychiatric social work. The Public Health Service program will eventually result in the establishment of hundreds of mental hygiene clinics. Their current goal is 1,300 additional clinics.

This Public Health Service program will go a long way toward making sound psychological counseling services available in all parts of the country to people from all economic and social levels. It is a far-sighted program of social betterment that will remedy many of the existing shortages. By making good services available, it will tend to drive out some of the poor services.

The third way in which the public can be protected against the psychological quack lies in the establishment of professionally and legally recognized standards of competence. Such standards would provide a ready yardstick with which all concerned could measure the competence of anyone who called himself a psychological counselor. We do not yet have such standards. In fact, we have only barely started on the task of establishing them. There are several ways in which such standards can be set.

Educational requirements can be established by a professional association or by an employer. Since the field of psychological counseling is only now emerging into the status of a recognized professional specialty, standards are very different in different agencies and places. They vary from practically no requirements at all in some agencies to possession of a Ph.D. in clinical psychology in others. The United States Army and Navy both require the Ph.D. for commissioning as a clinical psychologist. The Army requires the same degree for commissioning as a personnel psychologist. The Veterans Administration requires the Ph.D. for employment as a clinical psychologist at the P-4 and higher levels. Where strong agencies such as these can enforce high standards of employment, it assures their clients of competent service. It also serves as a pattern to be followed by other agencies. Thus, the Veterans Administration standards and the salary schedule which accompany these standards have forced many state agencies to raise their standards and salaries.

The Army, Navy, and VA requirement of a Ph.D. is higher than the standards set by the American Psychological Association for its members. Nevertheless, membership in the American Psychological Association and, particularly, membership in the Division of Clinical and Abnormal Psychology or in the Division of Counseling and Guidance Psychologists is sometimes used as a test of minimum competence of psychological counselors. But membership in an APA division is not a good method of setting standards. Neither is membership in a state or city association which has higher standards than does the APA. There are so many APA divisions and so

many city, state, and regional psychological associations that a psychologist has difficulty in keeping them all in mind. To expect the public to do so is foolish. Thus, to claim as a mark of competence the fact that one belongs to the Metropolitan New York Association of Applied Psychology is not very effective when another and less competent person can honestly say that he belongs to the national one called the American Psychological Association; and still another and this time completely unethical person can claim membership in, let us say, the International Psychological Society or some other non-existent group. Membership in a professional organization can only be useful as a mark of competence if the membership requirements are reasonably high, if they are strictly enforced, and if the existence and meaning of the association is widely known. Psychological associations, generally, are not well enough known to have membership serve as a particularly useful measure of competence.

The meeting of legally established requirements is a much better measure for general use than is the meeting of association membership requirements. Within one state, there can be only one set of legal requirements, while there can be half a dozen competing associations. The public understands the meaning of state licenses or state certificates; it does not understand the membership requirements of most professional organizations. It is, therefore, necessary that we work for the adoption of legal means of distinguishing the legitimate psychological counselor from the quack.

Two types of state laws are possible: certification laws and licensing laws. The reader will be familiar with the merits and difficulties of each, for both have been considered in New York State. Ultimately, we may hope for the general enactment of laws which will license the practice of psychology, much as medical practice is now subject to license laws. But if psychologists are to be licensed in order to practise, the law must contain workable definitions of the practice of psychology.

Satisfactory definitions are difficult to write. In the first place, when a psychologist listens to a client describing his difficulties and then either advises him how to solve those difficulties or lets him work out a solution of his own choice, he is engaging in a practice which is also, and quite legitimately, the province of the family physician, the lawyer, the minister, the social worker, the psychiatrist, and sometimes the old family friend. No licensing law can deny a person the right to seek the advice of these counselors.

If we attempt to define the practice of psychology so precisely that we can distinguish it from the advice given by these other types of counselors, we run into other difficulties. Is the administration of standardized tests a hallmark of psychological counseling? If so, is the school teacher a psychologist? Is the use of a detailed psychological interview a criterion? If so, do we wish to deny to the psychiatrist the right to use interviewing techniques?

It has been suggested that the practice of psychology might be defined in terms of money. Ordinarily, the family friend does not charge for the advice he gives, while the psychological consultant does. However, so does the psychiatrist, the lawyer, and the family doctor. Defining the practice of psychology as psychological service rendered for money is inherently unsatisfactory.

A third possibility is to define the psychologist in terms of the level of knowledge and skill he possesses. If we adopt this definition, we shall distinguish between the psychologist and the non-psychologist by examinations or by the satisfactory completion of a specified course of study. A definition of this type frankly admits what is a fact, *i.e.*, that others besides psychologists give counsel on human problems. But this is also true of the specialized guidance which law and medicine give. Much medical advice is given over the back fence, but a doctor is one who has satisfactorily met the standards required by the state examining board.

Defining the psychologist in terms of his skill and knowledge is, in my judgment, the only workable type of definition. Adopting this standard does not remove the necessity of also defining the psychologist in terms of his activities, but it allows us to specify the activities and then to say that a psychologist is one who performs these activities with a stated degree of proficiency and training. It is along these lines that we must develop our definition. As a start, we might use Armstrong's[1] recent definition of the practice of psychology and proceed to agreement upon the minimum level of proficiency necessary for the right to be called a psychologist.

Until we have arrived at a satisfactory definition, we are not ready to ask for licensing laws. We have not yet reached that stage. The definition of a psychologist is one of the most general and basic problems for the APA to settle. When the definition is written, it will necessarily be somewhat arbitrary. Must a psychologist have a Ph.D.? Must he have an M.A.? Must he have a given amount of practical experience? Can experience be substituted for graduate training, or training for experience? There are no answers to these questions except those that we agree upon. And we must soon agree.

Wherever we establish our minimum standard, we shall of course include a "grandfather clause" in order to avoid injustice to those who are thoroughly competent, but whose formal training was received before the new standards were adopted. After we have agreed and gotten our psychologist defined, we can begin work on the task of persuading state legislatures to enact licensing laws. When we reach that stage, I do not recommend attempting to do the job alone. Psychologists will be licensed, not for the benefit of psychologists, but for the benefit of the society they serve. That fact makes it desirable to have the licensing laws prepared and supported by other groups who are interested in the mental health and general welfare of society. The physician, the psychiatrist, the minister, and the lawyer can help us to prepare legislation that will protect society against the psychological racketeer. If they help prepare that legislation, they will support it; without their support, it will fail of its purpose.

I have been talking of licensing laws of the future. For the present, certification laws are a possible substitute. They do not bar the psychological fraud from business, but they do provide the discriminating client with a criterion he can use in choosing a counselor. Connecticut and Virginia have such laws. It is to be hoped that the one now contemplated in New York is enacted, for it would provide some protection for the citizens of New York and would also serve as an example to other states.

Since the purpose of certification laws is the same as that of licensing laws—the protection of the public against the fraud—it is desirable that they have the support of the other groups interested in community welfare. This means that certification laws, like licensing laws, should be worked out in cooperation with the medical profession and others who are interested in the welfare of society.

The final means at our disposal for protecting the public against the psychological fraud is through legal prosecution. This is a method of very limited usefulness at present. If the fraud, in addition to his purely psychological activities, violates medical practice regulations, there is a legal means of putting him out of business, but it is a risky method, for there is danger that legal action may also harm the legitimate psychologist. The closest cooperation is necessary between the medical and the psychological groups if this method of running the psychological fraud out of business is attempted.

A second legal means is applicable in a few cases. The federal postal laws provide punishment for anyone using the mails to defraud. If a quack psychologist does not conduct his business by mail, he is completely untouched by these laws. If he does use the mail for presumably fraudulent

purposes, it is necessary to establish first the fact that he has used the mail. That is normally easy. Second, it must be shown that he has promised to provide certain services or benefits or results if the prospective client will pay in advance for those benefits. This, too, can usually be demonstrated fairly easily. Finally, it must be demonstrated that he has not furnished the results or benefits that he promised. This is more difficult.

So far, only three persons have been charged with using the mails for psychological frauds. I served as a witness for the Post Office Department on all three cases.[10] It is interesting to know that the initiative in all three cases came from the Post Office itself. They had for some time been keeping a number of presumably fraudulent schemes under observation, but had not prepared charges because they had no one upon whom they could call for advice and testimony. Finally, they went to the American Council on Education. There they were referred to the American Psychological Association. They brought me the material they had collected on the three cases, explained what was necessary to secure fraud judgments, and asked for my help. I reviewed the material, helped prepare the charges, and later appeared as a witness for the government when two of the three cases came to trial.

The first of the cases sent, for a few dollars, a set of four lessons that were promised to give the purchaser friends, influence, better jobs, health, freedom from worry, and just about anything else he desired. For good measure, he also received a cheap metal good luck charm. I read the lessons very carefully, but I had no more friends, no more influence, no better job, no better health, and no fewer worries than I had had before. Besides, the post-office inspector kept the good luck charm. This case never came to trial. When presented with charges, its author agreed to go out of business rather than stand trial.

The second case consisted of a set of self-improvement lessons which their author, a mail-order Ph.D., sold under the title *Psychology That Works.* The trial was brief. After evidence showing that he had used the mails to make extravagant promises, and after I had testified that those promises could not be fulfilled by the lessons, the "Doctor" signed a cease and desist affidavit. As we walked out of the court room, the defendant shook hands with me and said, "I was very interested in your testimony, Dr. Wolfle. There was only one point on which I disagreed." His attorney immediately stopped him from saying any more, leaving me still intrigued to learn the one point on which my testimony disturbed him.

The most interesting of the cases was of a man who had advertised that for one dollar he would send a personality questionnaire. Upon receiving the completed questionnaire, he promised to reply with a diagnosis of the individual respondent's personality strengths and weaknesses. Actually, when the questionnaire was mailed in, all that the respondent got was a three-page mimeographed letter and information concerning a home-study course of lessons the man wished to sell and which he promised would result in the advancement, professionally, socially, and economically, of the person who took his correspondence course.

The case well illustrates the difficulty of attacking psychological frauds through the postal regulations. The man was defended by an extremely able trial lawyer who took advantage of every opening given him by the Post Office attorney. Incidentally, he gave me a three-hour cross-examination that I shall long remember. All told, I probably spent five days in helping the Post Office prepare the case and conduct the hearing. Thelma Hunt and the late John Jenkins each devoted a day to it. For defense witnesses, a government personnel man and a psychiatrist appeared. Each testified that the personality analysis furnished in response to the questionnaire was sound and that he would be willing to accept those analyses in his work. Perhaps

in their practices they would be justified in doing that. However, the man himself decided that his defense was not strong enough, that the judgment would probably go against him, and that he had better quit. At the end of the second day of hearings, therefore, he promised to cease advertising and mailing his personality questionnaire.

From the standpoint of the Post Office, the trial was a successful one. But from society's standpoint, I am not sure that much was gained. The self-advancement course was not under attack, so that the man is free to continue to advertise and sell it. He will remain so unless the postal authorities decide to bring charges and obtain a judgment against that activity. As for the personality questionnaire and analysis, he is perfectly free to continue to sell it so long as the United States mail is not involved.

All told, the postal laws are not a strong defense against the psychological fraud, since they only apply to persons who use the mails, and even if the trial ends in a judgment against the person, there is nothing to prevent his continuing his activities outside of United States mail channels. Nevertheless, the postal laws provide us with one means of attacking the psychological quack. I have, therefore, asked Dr. Thelma Hunt to serve as a consultant to the Post Office mail-fraud inspectors on psychological schemes that appear to be fraudulent.

The strongest legal means of prosecuting psychological frauds will come when we have established licensing laws. Then it will be possible to accuse them of violating the psychological practices acts and to bring them to trial on those grounds. But first the licensing laws are necessary, and as I have pointed out earlier we do not have these laws and are not yet ready to ask for them. They will, however, come in time. When they do, they will give the public better protection than any method now available.

I have outlined four different methods that may be followed in our efforts to protect the public against the psychological quack: popular education, making good psychological services more generally available, establishment of legal standards of competence, and legal prosecution. Psychologists must work along all four lines. But we cannot work alone. It is in our interest and in the public interest to enlist the help of other groups. Medicine is particularly important, since there is no sharp line between a person's psychological difficulties and his organic ailments—neither is there a sharp line separating the medical quack from the psychological quack. It is to the interest of the public and to the interest of both medicine and psychology to drive out both types of quacks. Medicine and psychology should cooperate in both efforts.

Medical help, however, is not enough. We also need assistance from the clergy, the country's educators, government agencies, and the press. We need, in short, the help of all groups interested in society's welfare. Different groups can help in different ways. The newspapers will be most helpful in public education concerning the problem and concerning the desirability of laws designed to curb the activities of the quack. The other groups can be helpful in general education and in the drafting of appropriate legislation.

What can we expect to accomplish if we follow all four lines of attack that I have described? We certainly cannot expect any great changes overnight. A great deal of work and considerable time will be required. Even then we can expect only partial success, for, despite their greater age and stronger legal position, other professions still have their fraudulent fringes. The shyster lawyer and the quack doctor exist and sometimes thrive despite the efforts of the legal and medical professions to protect the public against their fraudulent activities. We shall never rid the world entirely of psychological quacks as long as some people are avaricious and others gullible.

Thus, we cannot expect complete suc-

cess. But we can reach a time when the ordinary citizen may know what to expect in the way of psychological service and may know where to find competent ethical psychological consultants. We can reach a time when the troubled person who turns to the classified telephone directory for the name of a psychologist will find the legitimate ones clearly listed. And we can reach a time when the psychological quack will constantly face the threat of prosecution and punishment for his illegal activities.

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SECTION OF ANTHROPOLOGY

THE MOST ANCIENT PERUVIAN FARMERS

By JUNIUS BIRD*

The pictures illustrating this report cover the field work undertaken by the American Museum of Natural History in Peru in 1946-47. This was a part of the cooperative Viru Valley study under the Andean Institute and consisted of an examination of the pre-ceramic midden deposits in the Viru and Chicama valleys.

As virtually nothing is known of the pre-ceramic horizon in Peru, the results of this work will be of some interest, but until the collection is released by the Peruvian government exact identification of the plant remains and technical data on the associated artifacts cannot be determined.

On the basis of field observations, it appears that the huge midden deposits of this early time, one of them running to forty feet in thickness, mark a cultural period in which the local economy was based in part on a simple agriculture, in part on fishing. The associated artifacts comprise a surprisingly meager list: hammerstones, cores, rough unretouched flakes, perforated stone net sinkers, bone bodkins, fish nets, scraps of textiles, mats, basketry, bark cloth, and gourd containers. The cultivated plants were cotton, gourds, squash, chili peppers, four(?) varieties of beans, and *Canna*. None of these are found wild in the valleys today.

Tubers from the "junco" (*Scirpus*) and a nut sedge and cattail roots were also eaten. Of wild fruits, the "lucuma", "ciruela de friarle" and "guava" were the most common.

The balance of food was mainly from the sea: sea urchins, crabs, fish, rarely sea lion and porpoise, and a relatively small amount of shell fish as the adjacent beaches do not produce shell fish in quantity. Bird bones are reasonably abundant but no land mammal bones were found in sifting reasonably large samples of the debris. Cooking was done with hot stones.

The whole complex is more striking by what it lacks rather than what it has. Pottery, maize, weapons, and the pressure technique of flaking stone are outstanding absentees.

At two sites where the debris of the pre-ceramic level merged with debris containing potsherds, the oldest maize was associated with the ceramics of the Cupisnique or coastal Chavin culture.

The lack of pressure flaking is curious, particularly as the same region yielded workshop sites of an apparently earlier hunting people who made many pressure flaked artifacts. Obviously, the farming-fishing population did not here evolve from the hunting stage, for a trait like pressure flaking would not abruptly disappear. The absence of weapons supports this assumption. Though many wood fragments survived, there was no trace of spears, darts or harpoons, nor any points for either group. A few toy sling fragments show the people were familiar with this weapon, but it clearly was of no major importance.

The basketry is all of twined construction, as are most of the mats and textile fragments. The latter are entirely of cotton and show twining, looping, and knotting as the major techniques, with true weaving forming only a minor percentage of the total. A little blue dyed yarn was employed; the only other color, a red, seems to have been limited to a pigment.

Though mud-plastered cane huts seem to have been used to some extent in the early stages, the upper halves of the great pre-ceramic mounds are filled with small

* American Museum of Natural History, New York, N. Y. This lecture, illustrated by lantern slides, was presented at the meeting of the Section of February 23.

subterranean houses. Where cobblestones were available, these were walled up with cobbles set in a mortar made of the mound debris. Lacking cobbles, rough rectangular clay adobes were used to line the same type of structure. With the latest preceramic material are above-ground clay walls and rectangular houses. Accompanying the first pottery are other walls in which cylindrical adobes were set on end. These, in turn, are overlain by walls made of roughly conical adobes associated with debris yielding the Cupisnique sherds. Curiously, the use of stone-lined subterranean houses survived into Cupisnique times. This might be interpreted as confirmation of impressions received at the excavation sites, that the presence of pottery and other distinctive items marks the arrival in the area of a new population which did not drive off or exterminate the established group but blended with it.

As yet we have no positive means of estimating the age of these earliest known Peruvian farmers. Artifact-bearing soil sections show that most of the soil in the valleys has accumulated since the beginning of farming, and this alone implies a considerable antiquity. It does not seem unreasonable to accept the guess date of 1,000 B. C. for the first of the Cupisnique ceramics. If the nature and extent of the earlier debris can be taken as an index, then farming started one to two thousand years earlier.

Note. The Section of Physics and Chemistry held a meeting on February 3, 1948, at which Doctor Turner Alfrey, Jr., presented a paper entitled, *Factors Determining Reactivity of Organic Compounds with Free Radicals (Copolymerization Reaction and Chain Transfer Reactions).* No abstract of this paper has been received.

NEW MEMBERS

Elected February 26, 1948

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